

A Widespread New Species in the Neotropical Berry-fruited Genus *Clidemia* and Range Extension of *Ossaea quadrisulca* (Melastomataceae: Miconieae)

Ricardo Kriebel

Department of Botany, California Academy of Sciences, 875 Howard St., San Francisco, California 94103-3098, and Instituto Nacional de Biodiversidad, Apartado 22-3100, Santo Domingo de Heredia, Costa Rica rkriebel@calacademy.org

Clidemia almedae, a new species from Costa Rica, Panama, Colombia and Ecuador is described. The new species is closest morphologically to *C. discolor* from which it differs in the following characters: larger shrub or small tree with eciliate, larger leaves, long-pedunculate, bracteate inflorescences with sessile flowers congested in dense glomerules and subtended by ovate bracteoles, and larger berries. Diagnostic illustrations and color photographs of *C. almedae* at the type locality are included. The distributional range of *Ossaea quadrisulca* is extended to Mesoamerica on the basis of collections from Costa Rica.

Resumen

Clidemia almedae, una nueva especie de Costa Rica, Panamá, Colombia y Ecuador es descrita. La nueva especie es morfológicamente más cercana a *C. discolor* de la cual difiere en las siguientes características: arbusto más grande o árbol pequeño, hojas eciliadas más grandes, inflorescencias largo-pedunculadas, bracteadas, con flores sésiles en glomérulos densos y subtendidas por bracteolas ovadas, y bayas más grandes. Se incluyen ilustraciones diagnósticas, así como fotografías a color de *C. almedae* en la localidad tipo. El rango de distribución de *Ossaea quadrisulca* es extendido a Mesoamérica en base a colecciones de Costa Rica.

The Miconieae is the most diverse tribe of Melastomataceae with 30 genera and over 2200 species (Michelangeli et. al. 2004). Radiation in the tribe appears to be related to the presence of berry fruits, which have been favored by birds as dispersal agents. The second largest genus in the Miconieae after the “mega” diverse *Miconia* is *Clidemia* with over 180 species. *Clidemia* is separated from *Miconia* only by its lateral to pseudolateral inflorescences (Almeda 2004). Cogniaux (1888) separated *Clidemia* into five sections, but the characters used are highly suspect in defining monophyletic groups (Almeda 2004). For further detail on the circumscription of *Clidemia* see Almeda (2004).

In connection with field work conducted for the Manual of the Flora of Costa Rica project, botanists visited previously little-explored localities on the northern Caribbean slope of the Talamanca mountain range. Work in this region resulted in the discovery of one new species and one new distributional record of Melastomataceae for Costa Rica.

The new species of *Clidemia* described below was found at El Copal Wildlife Refuge, also in Pejibaye, Cartago, and is, in fact, widely distributed in southern Central America and northern South America.

Clidemia almedae Kriebel, sp. nov.

Figures 1–2.

TYPE.— **COSTA RICA:** Cartago: Cantón de Jiménez, Pejibaye, Selva, Reserva Biológica El Copal, 9°47'N, 83°45'W, elev. 900–1080 m, 5 July 2005, (fl, fr), R. Kriebel & P. Ortiz 5106 (HOLOTYPE: INB!; isotypes: CR!).

Ramuli teretes sicut foliorum inflorescentia hypanthiaque glabri vel inconspicuo asperis induti. Petioli (2.5–) 4–12.7 cm longus; lamina (11–)18–32 × (8.5–)14–23.5 cm ovata vel rotundata apice acuminata basi cordata vel rotundata, 7–9-nervata vel 7–9-plinervata. Inflorescentia lateralis 2–5.4 cm longa multiflora; flores 4-meri, bractis et bracteolis 2–4 × 1–2.5 mm. Calycis tubus 0.75 mm longus, lobis interioribus 1–1.25 × 1–1.25 mm ovatis, dentibus exterioribus 2–2.5 × 2 mm ovatis. Stamina isomorphica glabra, antherarum thecae 1.25 × 0.5 mm oblongis poro truncato vel dorsaliter inclinato; connectivum nec. prolongatum nec appendiculatum. Ovarium 3–4-loculare et omnino inferum glabrum

Shrubs 1–4 m tall. Internodes rounded-quadrate; branchlets, petioles and elevated primary leaf veins below inconspicuously farinose-furfuraceous with minute hairs mostly less than 0.1 mm long. Leaves of a pair ± equal to unequal in size; petioles (2.5–) 4–12.7 cm long; blades (11–) 18–32 × (8.5) 14–23.5 cm, ovate to rounded, apex acuminate, base cordate to subcordate, margin obscurely serrulate to serrulate-crenulate and ciliolate, 7–9-nerved or plinerved, innermost pair of primary veins arising ca. 1 cm above the blade base, adaxial surface glabrous or sometimes minutely pubescent on the primary veins towards the blade base, abaxial foliar surface inconspicuously farinose-furfuraceous on primary, secondary and higher order veins, otherwise glabrous. Inflorescence 2–5.4 cm long, an axillary cyme branched at the base into (1–)2–4(–6) bracteate, stout peduncles ca. 1.5–5 cm long terminating in aggregated glomerules of sessile flowers, often borne on defoliated nodes, peduncle divided nearly half way or towards the distal half of its length by two opposing and early deciduous bracts; bracts and bracteoles 2–4 × 1–2.5 mm, oblong to ovate. Flowers 4-merous, sessile, each subtended by 2–3 bracteoles. Hypanthia (at anthesis) suburceolate with a cylindrical distal neck 1 mm long, glabrous. Calyx tube 0.75 mm long, calyx lobes 1–1.25 × 1–1.25 mm, ovate-triangular, fleshy, erect and totally concealed by the calyx teeth; calyx teeth 2–2.5 × 2 mm, broadly ovate, mucronate, fleshy, glabrous, widely spreading at anthesis and in fruit. Petals 2 × 1.25 mm, glabrous, translucent-white, oblong. Stamens isomorphic; filaments 2.25 mm long, glabrous, white; anthers 1.25 × 0.5 mm, white, turning brown with age, oblong, with a truncate to somewhat dorsally inclined apical pore, deeply channeled ventrally between the two anther cells; connective somewhat thickened dorsally but neither prolonged nor appendaged below the thecae. Ovary 3–4-locular, completely inferior, apex glabrous and smooth. Style 5–6 mm long, glabrous, erect to minutely declined at anthesis; stigma punctiform. Berry 5 × 5–6 mm, dark purple. Seeds 0.4 mm long, beige, ovoid to obovoid with a vaguely rugulose testa.

PHENOLOGY.— Specimens with flowers and fruits have been collected from May through November.

DISTRIBUTION.— Known from rain forest and cloud forest in Costa Rica, Panama, Colombia and Ecuador at elevations from (480–)700–1100 m.

PARATYPES.— **COSTA RICA:** Cartago: Cantón de Jiménez, Pejibaye, Selva, Reserva Biológica El Copal, 9°47'N, 83°45'W, 30 Jan. 2003, Kriebel & Solano 2491 (CR, INB, MO); Cantón de Jiménez, Pejibaye, Selva, Reserva Biológica El Copal, sendero EL Ron Ron, 9°47'N, 83°45'W, 28 May 2005, Solano et al. 2432 (CR, INB); Cantón de Turrialba, Parque Nacional Barbilla, sendero Topoyiyo, 9°58'N, 83°27'W, Mora & Rojas 1481 (CR, INB); Cantón de Turrialba, Javillo, 9°58'N, 83°27'W, 30 Nov. 1994, Umaña et al. 636 (CAS, CR); 13.6 km NE of Turrialba on road to Siquirres, 16 July 1976, Utley & Utley 5435 (CAS). **Heredia:** Parque Nacional Braulio Carrillo, sendero La Botella, 10°09'N, 83°57'W, 11 Feb. 1993, Morales et al. 1096 (INB).

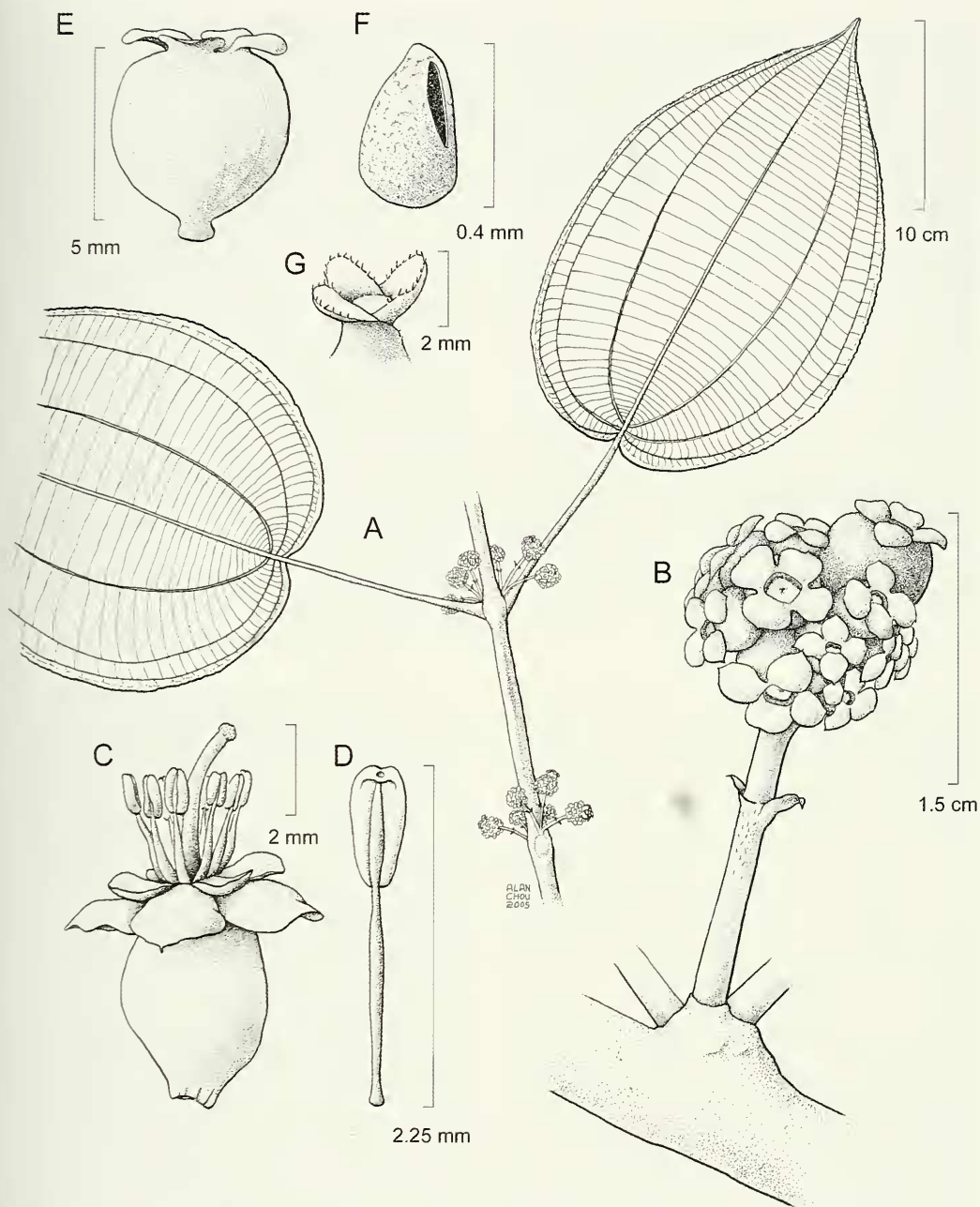


FIGURE 1. *Clidemia almedae*. A. habit; B. inflorescence; C. flower; D. stamen, dorsal view; E. fruit; F. seed; G. bract-oles. (A–G from Kriebel & Ortiz 5106).

Limón: Cantón de Pococí, Parque Nacional Braulio Carrillo, Estación Quebrada Gonzáles a Salsipuedes, 10°09'N, 83°56'W, 11 Feb. 1993, Hammel et. al. 18817 (INB); Cantón de Siquirres, Altos Pascua, Quebrada Linda, 10°01'N, 83°38'W, 1 Apr. 2001, *Morales 7824* (INB). **PANAMA: Veraguas:** Vicinity of Santa Fé, along dirt road from Santa Fé to Río San Luis, past Escuela Alto de Piedra, at Río Segundo Brazo (2nd stream below school on Atlantic Coast), 8°33'N, 81°08'W, 28 June 1987, *Croat 66882* (CAS, MO); 2–5 km NW de Santa Fé por el camino a Río Calovébora, 26 Aug. 1984, *Hernández et. al. 747* (CAS, MO); Road past Escuela Agrícola Alto Piedra above Santa Fé to Continental Divide, *Sytsma & Andersson 4783* (CAS, MO). **COLUMBIA: Dpto. del Chocó:** Municipio de San José del Palmar, hoy del Río Torito (afluente del Río Hábita), declive occidental, Finca “Los Guaduales”, 1 Mar. 1980, *Forero et. al. 6278* (CAS). **ECUADOR: Pichincha:** Cantón de Quito, Parroquia Puerto Quito, Reserva Forestal de ENDESA, 10 km al norte de Alvaro Pérez Intriago, 11 June 1990, *Cerón & Ayala 10101* (CAS, MO, QCNE); Road Pedro Vicente Maldonado-El Cisne-La Celica, km 10 from Pedro Vicente Maldonado, 79°03'N, 00°08'W, 15 Sept. 2001, Cotton et. al. 1720 (CAS, QCA); ca. 10 km from Santo Domingo de los Colorados, property of Tinlandia, 10 May 1980, *Sobel & Strudwick 2328* (CAS).

DISCUSSION.—*Clidemia almedae* belongs in a species complex that includes *C. discolor* (Triana) Cogn., *C. ostrina* Gleason, *C. crotonifolia* Pilger, *C. cordata* Cogn., and *C. urticoides* Pilger. These species share a furfuraceous indument: leaves which tend to have rounded to cordate bases; truly axillary inflorescences often borne on defoliated nodes; 4-merous flowers; well-developed calyx teeth that often obscure the true calyx lobes; simple anther connectives; a completely inferior ovary; and smooth, granulate, asperulate, or vaguely rugulose, small seeds. Specimens in this complex tend to dry red, especially if treated with alcohol, and are a good source of red dye (pers. obs.). Except for *C. almedae*, all of the species mentioned above share a similar inflorescence architecture of laxly branched cymes with pedicellate flowers (but see below for comments on *C. urticoides*). Wurdack (1976) noted that the sizes of the inflorescences in *C. discolor* and *C. ostrina* are too variable to be of taxonomic utility. His assessment applies to the other members of this species group. The inflorescence of *C. almedae* differs from other members of this species complex by the presence of common bracteate peduncles and sessile flowers in congested glomerules that are subtended by two to three ovate bracteoles.

Wurdack (1976) believed *C. crotonifolia* and *C. cordata* were probably synonyms of *C. discolor*; but he evidently did not study the types. He also cited recent Peruvian collections from San Martín and Amazonas that were referable to *C. discolor*. Although it remains unclear whether these two species are synonymous with *C. discolor*, they are different from *C. almedae* in their laxly branched inflorescences. I thought the most similar species to *C. almedae* was *Clidemia urticoides*, that is until I examined the specimen *Killip & Smith 26340* (US), which had been cited by J.F. Macbride (1941) under this species for the *Flora of Peru*. Macbride noted that the specimens cited by him, which include the type *Ule 6204*, had been annotated as *C. cordata* by the late Henry Gleason but Macbride thought the inflorescences were different. The specimen *Killip & Smith 26340* (US) has five inflorescences with no flowers or fruits; it differs from typical *C. discolor* in the reduced inflorescences, but it is evident that the inflorescences lack common, bracteate peduncles. The branching in the inflorescences in *Killip & Smith 26340* suggests that *C. urticoides* falls within the range of variation exhibited in the inflorescences of *C. discolor*. Furthermore, *C. urticoides* has smaller leaves with ciliate margins like those of *C. discolor*. The type and other collections of *C. urticoides* are from Peru, the only country from which it is known. Although *Clidemia discolor* is also known from Peru, *C. almedae* is not, further suggesting the relationship of *C. discolor* and *C. urticoides* but not of *C. almedae*, which is known from Costa Rica, Panama, Colombia and Ecuador. It is possible that this complex includes only three “good” species: *C. almedae*, *C. discolor*, and *C. ostrina*, and that *C. crotonifolia*, *C. cordata*, and *C. urticoides* are synonyms of *C. discolor*.



FIGURE 2. *Clidemia almedae*. A. flower; B. fruit; C. and D. inflorescences. (From live material of Kriebel & Ortiz 5106)

Wurdack (1976) also noted the distinct congested inflorescence of what is here described as *C. almedae* and stated: "Throughout most of the range of the complex occasional collections show capitate-agglomerate inflorescences with variable 'peduncle' length; I believe these inflorescences are diseased or resulting from arthropod injury and that (ex char. and photo) *C. urticoides* will prove synonymous with *C. discolor*". Wurdack also questioned the specimens from Pichincha and Cotopaxi with long-pedunculate and bracteate inflorescences in the *Flora of Ecuador*. I have looked at live flowering and fruiting plants of both *C. discolor* and *C. almedae* in Costa Rica. *Clidemia discolor* is common in the Caribbean lowlands and south Pacific slope of the country; it is commonly a small shrub with ciliate leaves and laxly branched inflorescences. In those specimens with reduced inflorescences, the lax branching pattern is still evident and never resemble the inflorescences of *C. almedae*. Also, *C. discolor* tends to have smaller leaves and smaller fruit, which turn red and then purple, and subulate bracteoles. *Clidemia almedae* appears to have a patchy distribution, but it can be locally common. At the type locality, *C. almedae* is a common shrub or small tree that is dominant in secondary forests and forest margins. Although the length of the peduncle may vary, it is always present, the bracts are obvious, and the flowers, which are borne in dense clusters, are always sessile and subtended by ovate bracteoles. I have found no evidence of insect infestation or diseased inflorescences in a large population of *C. almedae*. Ovary locule number was counted in 35 dissected immature and mature fruits; 20 were 4-locular and 15 were 3-locular. This variation is not exhibited in the constant 4-locular ovary of *C. discolor*. I have not found both species growing together, but it is possible that they do grow sympatrically in places like the Caribbean slope of the Central Cordillera of Costa Rica, in Braulio Carrillo National Park, where one of the paratypes of *C. almedae* was collected (Hammel 18817) and populations of *C. discolor* occur nearby (e.g., La Selva Biological Station, Heredia).

Other species related to this complex are *C. epiphytica* (Triana) Cogn., *C. cursoris* Wurdack, and *C. rodriguezii* Almeda, all of which have large leaves with a rounded to cordate base, axillary inflorescences commonly borne on defoliated nodes, 4-merous flowers, well developed calyx teeth, simple anther connectives, a completely inferior ovary and smooth, granulate, asperulate or vaguely rugulose small seeds. All of the above mentioned species differ from *C. almedae* in the structure of the inflorescence. *Clidemia epiphytica* also differs in its anisophyllous leaves and scandent habit, whereas *C. cursoris* and *C. rodriguezii* differ, among other things, in their conspicuously quadrate to carinate stems.

ETYMOLOGY.— It is with great pleasure that I name this species for Dr. Frank Almeda (CAS), who has studied the Melastomataceae for more than 30 years and recently finished an account of this greatly diverse family of flowering plants for the *Flora Mesoamericana*. I would also like to thank Dr. Almeda for donating most of his personal literature collection to the Botany Department at INB, which has been and continued to be of inestimable help in our ongoing studies of the flora of Costa Rican.

Comment on a new record for *Ossaea quadrisulca* (Naudin) Wurdack

Ossaea quadrisulca (Naudin) Wurdack (*R. Kriebel* 3913, CAS, CR INB, MO) from the La Marta Wildlife Refuge, Pejibaye, Cartago, was previously known from Colombia, Ecuador, Peru and Bolivia; this constitutes a confirmed new record for the Costa Rican flora. The specimens cited above are not the first known from Costa Rica; Wurdack (1973) cited *Schnell* 658 from Valle Escondido, Cartago, as perhaps belonging to this species, but he noted differences in pubescence and floral merosity. After studying pickled flowering material from Costa Rica and comparing it to specimens of South America, it is clear both belong to the same entity.

ACKNOWLEDGMENTS

I would like to thank the National Institute for Biodiversity (INB) for all the support in conducting the field work that resulted in the finding of the new species. I also thank Daniel Solano for additional photographs and additional pickled material. For field assistance and companionship visiting the type locality on various occasions I thank Daniel Solano, Patricia Ortiz, Hilde Haehner, Marcela Kriebel and Ricardo Kriebel C. For the line drawing I am grateful to Alan Chou. Rusty Russell (US) kindly searched for a requested specimen and sent it on loan to CAS. Special thanks to Alberto Chaves and the rest of the people at El Copal Biological Station for logistical support and special attention.

LITERATURE CITED

- ALMEDA, F. 2004. Novelties and nomenclatural adjustments in the Neotropical genus *Clidemia* (Melastomataceae: Miconieae). *Proceedings of the California Academy of Sciences*, ser. 4, 55(4):89–124.
- COGNIAUX, A. 1888. Melastomataceae (*Clidemia*). In C.F. P. von Martius, *Flora Brasiliensis* 14(4):468–511.
- MACBRIDE, J.F. 1941. Melastomataceae in Flora of Peru. *Field Museum of Natural History, Botanical Series* 13(4/1):249–521.
- MICHELANGELI, F.A., D.S. PENNEYS, J. GIZA, D. SOLTIS, M.H. HILS, AND J.D. SKEAN JR. 2004. A preliminary phylogeny of the tribe Miconieae (Melastomataceae) based on nrITS sequence data and its implications on inflorescence position. *Taxon* 53(2):279–290.
- WURDACK, J.J. 1973. Certamen Melastomataceis XXII. *Phytologia* 26(6):397–408.
- WURDACK, J.J. 1976. Certamen Melastomataceis XXV. *Phytologia* 35(1):1–13.
- WURDACK, J.J. 1980. Melastomataceae. In G. Harling and B. Sparre, eds., *Flora of Ecuador* 13:1–406.